

Figure 50. Location of surface-water stations in the Columbia River Basin between Wallula Lake and Stevenson including Walla Walla, Klickitat, and White Salmon River Basins.

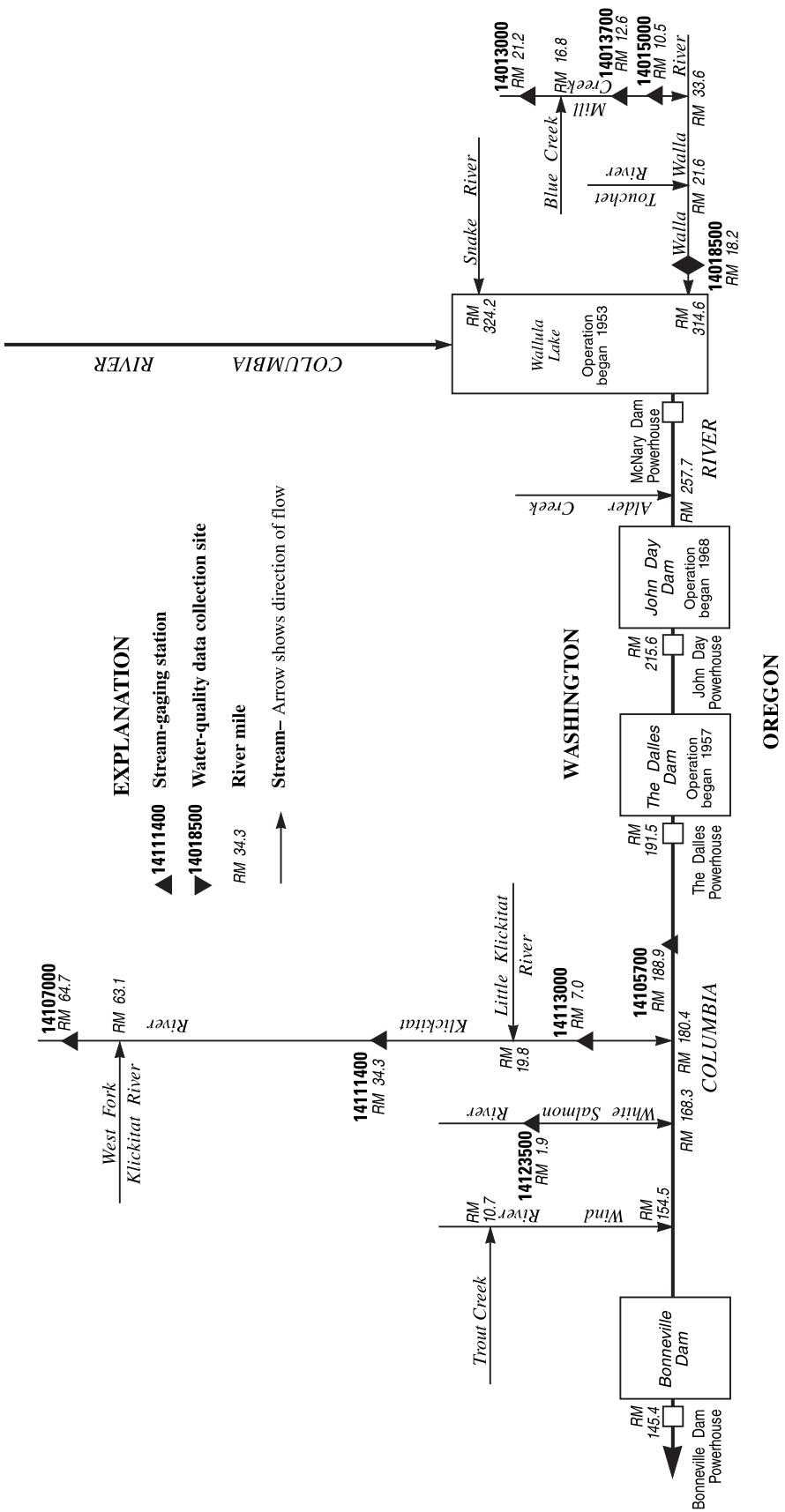


Figure 51. Schematic diagram showing surface-water stations in the Columbia River Basin between Wallula Lake and Stevenson including Walla Walla, Klickitat, and White Salmon River Basins.

WALLA WALLA RIVER BASIN

14013000 MILL CREEK NEAR WALLA WALLA, WA

LOCATION.--Lat 46°00'29", long 118°07'03", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.7, T.6 N., R.38 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 0.1 mi downstream from Railroad Canyon, 4.0 mi downstream from City of Walla Walla diversion dam, 4.4 mi upstream from Blue Creek, 11.5 mi southeast of Walla Walla, and at mile 21.2.

DRAINAGE AREA.--59.6 mi².

PERIOD OF RECORD.--August 1913 to September 1917, April to September 1938, October 1939 to September 1976, October 1979 to current year. Maximum discharge and occasional discharge measurements 1977-79.

REVISED RECORDS.--WSP 1398: 1946-48(M), 1950 (M). WSP 1935: 1959, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,995.85 ft above NGVD of 1929 (levels by U.S. Corps of Engineers). Prior to Oct. 1, 1938, nonrecording gages at about same site at different datums.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No regulation. City of Walla Walla diverts about 28 ft³/s 4.0 mi upstream from station for municipal use. Water temperatures March 1962 to July 1965. Sediment records March 1962 to July 1965. U.S. Geological Survey telephone telemeter at station.

AVERAGE DISCHARGE.--65 years (water years 1914-17, 1940-76, 1980-2003), 96.2 ft³/s, 69,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,350 ft³/s Feb. 9, 1996, gage height, 20.43 ft, from rating curve extended above 1,600 ft³/s on basis of slope-area measurement of peak flow; minimum daily discharge, 9.5 ft³/s Dec. 9, 10, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 31 or Apr. 1, 1931, reached a discharge of about 11,000 ft³/s, based on slope-area measurement about 900 ft upstream at old City of Walla Walla diversion dam.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

	Date	Time	Discharge (ft ³ /s)	Gage height (ft)		Date	Time	Discharge (ft ³ /s)	Gage height (ft)
	Jan 27	0215	949	16.55		Feb 1	0345	*1,950	*17.61

Minimum discharge, 27 ft³/s, part or all of each day Oct. 7-14, 16-24.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	33	36	92	1,480	98	249	136	65	e34	e34	e31
2	31	33	36	86	703	92	247	131	60	e33	e30	e32
3	30	35	36	182	415	90	234	128	58	e34	e32	e32
4	31	36	36	154	282	86	206	134	53	e34	e35	e32
5	29	35	36	144	217	86	182	183	51	e34	e31	e33
6	28	35	36	107	176	88	174	191	49	e35	e33	e32
7	28	36	36	79	149	164	163	177	48	e35	e34	35
8	27	44	35	63	130	267	177	155	47	e35	e33	48
9	28	51	36	55	114	305	199	136	46	e32	e30	41
10	28	49	37	50	102	349	201	121	43	e32	e31	39
11	27	41	37	48	92	356	195	122	41	e32	e31	36
12	27	40	42	48	85	393	186	153	40	e32	e32	35
13	27	41	44	58	84	523	181	183	39	e32	e31	35
14	27	42	74	57	83	493	165	181	38	e32	e30	35
15	29	40	60	57	82	518	144	165	38	e34	e30	36
16	28	38	67	56	115	576	131	142	38	e35	e31	37
17	27	38	54	53	144	380	128	126	38	e35	e30	37
18	27	38	52	51	194	271	127	112	39	e35	e29	37
19	27	38	46	49	202	216	116	97	39	e33	e28	37
20	28	38	43	48	195	189	114	87	38	e33	e29	36
21	27	38	42	47	196	178	118	85	40	e33	e30	36
22	27	38	39	49	249	237	128	83	41	e34	e32	36
23	27	39	39	63	237	315	124	84	39	e34	e34	36
24	28	40	39	67	191	270	132	88	38	e33	e32	36
25	28	38	37	79	156	245	132	103	37	e33	e30	36
26	31	37	37	349	134	291	144	94	38	e33	e29	36
27	31	36	44	759	119	284	157	89	37	e33	e28	36
28	34	36	48	406	107	237	162	85	37	e33	e30	35
29	37	36	55	290	---	194	156	80	37	e33	e31	36
30	35	36	64	897	---	169	145	81	36	e35	e30	36
31	35	---	102	1,130	---	197	---	79	---	e33	e30	---
TOTAL	906	1,155	1,425	5,673	6,433	8,157	4,917	3,811	1,288	1,038	960	1,075
MEAN	29.2	38.5	46.0	183	230	263	164	123	42.9	33.5	31.0	35.8
MAX	37	51	102	1,130	1,480	576	249	191	65	35	35	48
MIN	27	33	35	47	82	86	114	79	36	32	28	31
AC-FT	1,800	2,290	2,830	11,250	12,760	16,180	9,750	7,560	2,550	2,060	1,900	2,130

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2003, BY WATER YEAR (WY)

MEAN	36.7	72.6	112	131	157	161	174	138	74.7	37.7	30.9	31.5
MAX	105	263	376	362	548	410	420	495	260	69.8	48.7	47.5
(WY)	(1952)	(1996)	(1965)	(1965)	(1996)	(1997)	(1917)	(1917)	(1974)	(1974)	(1975)	(1959)
MIN	19.4	24.1	32.9	33.7	44.3	45.4	46.5	40.1	27.7	23.0	20.4	20.7
(WY)	(1940)	(1940)	(1966)	(1944)	(1994)	(1941)	(1941)	(1992)	(1992)	(1994)	(1987)	(1983)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1914 - 2003

ANNUAL TOTAL	35,471	36,838	96.2
ANNUAL MEAN	97.2	101	180
HIGHEST ANNUAL MEAN			54.1
LOWEST ANNUAL MEAN			1941
HIGHEST DAILY MEAN	1,080	Apr 14	3,240
LOWEST DAILY MEAN	25	Aug 14	9.5
ANNUAL SEVEN-DAY MINIMUM	25	Aug 14	10
ANNUAL RUNOFF (AC-FT)	70,360	73,070	69,660
10 PERCENT EXCEEDS	226	204	204
50 PERCENT EXCEEDS	48	41	58
90 PERCENT EXCEEDS	27	30	28

e Estimated

14013700 MILL CREEK AT FIVE MILE ROAD BRIDGE, NEAR WALLA WALLA, WA

LOCATION.--Lat 46°05'09", long 118°13'38", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.18, T.7 N., R.37 E., Walla Walla County, Hydrologic Unit 17070102, on right bank 4.2 mi downstream from Blue Creek, 3.0 mi upstream from diversion to Bennington Lake, 6 mi east of Walla Walla, and at mile 12.6.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--November 1997 to current year (seasonal records).

GAGE.--Water-stage recorder. Elevation of gage is 1,348 ft above NGVD of 1929 (levels by Walla Walla County).

REMARKS.--Records poor. No regulation. City of Walla Walla diverts water for municipal supply about 13 miles upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, unknown, Feb. 1, 2003, gage height, unknown; maximum gage height, 9.91 ft Feb. 24, 2002; minimum discharge, 29 ft³/s, Nov. 1, 2, 2002.

EXTREMES FOR PERIOD NOVEMBER TO APRIL.--Maximum discharge, unknown Feb. 1, gage height, unknown; minimum discharge, 29 ft³/s Nov. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR NOVEMBER 2002 TO APRIL 2003
DAILY MEAN VALUES

DAY	NOV	DEC	JAN	FEB	MAR	APR
1	31	e35	139	e1,800	158	289
2	30	e35	118	798	150	310
3	32	e35	209	482	149	310
4	33	e35	167	370	144	287
5	32	e35	153	297	143	265
6	32	e35	120	249	145	261
7	34	38	96	215	210	251
8	45	38	82	192	381	261
9	52	39	72	175	449	281
10	50	40	65	160	522	279
11	42	41	61	147	530	269
12	41	46	60	138	551	255
13	44	51	72	135	628	244
14	e43	78	72	139	496	226
15	e42	77	75	132	562	201
16	e37	85	73	180	737	183
17	e37	75	70	220	520	177
18	e37	68	67	277	386	174
19	e37	65	65	284	310	158
20	e37	58	62	273	258	152
21	e37	56	61	267	231	156
22	e37	55	64	303	274	167
23	e40	55	87	291	326	159
24	e41	54	98	257	306	169
25	e37	53	107	227	287	173
26	e35	53	e280	203	323	195
27	e35	63	e1,000	184	326	211
28	e35	70	e700	170	290	221
29	e35	86	e480	252	214	---
30	e35	111	e1,100	224	199	---
31	155	e1,400	241	---	---	---
TOTAL	1,135	1,820	7,275	8,565	10,509	6,697
MEAN	37.8	58.7	235	306	339	223
MAX	52	155	1,400	1,800	737	310
MIN	30	35	60	132	143	152
AC-FT	2,250	3,610	14,430	16,990	20,840	13,280

e Estimated

WALLA WALLA RIVER BASIN

14015000 MILL CREEK AT WALLA WALLA, WA

LOCATION.--Lat 46°04'35", long 118°16'21", in NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.23, T.7 N., R.36 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 200 ft downstream from diversion dam, 1.5 mi east of Walla Walla, and at mile 10.5.

DRAINAGE AREA.--95.7 mi².

PERIOD OF RECORD.--April 1941 to current year.

REVISED RECORDS.--WSP 1288: Drainage area. WSP 1348: 1943, 1945-46.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,165.49 ft above NGVD of 1929 (levels by U.S. Corps of Engineers). April 1941 to June 11, 1941, nonrecording gage, and June 11, 1941, to Jan. 22, 1957, water-stage recorder, at sites 0.8 mi downstream at different datum. U.S. Geological Survey telephone telemeter at station.

AVERAGE DISCHARGE.--62 years (water years 1942-2003), 80.0 ft³/s, 57,960 acre-ft/yr.

REMARKS.--No estimated daily discharges. Records fair except for those below 10 ft³/s, which are poor. Some regulation at diversion dam 200 ft upstream from station where water is diverted into Yellowhawk and Garrison Creeks for stock and irrigation. Since Nov. 19, 1941, water has been diverted 1.0 mi upstream into Mill Creek Reservoir for flood control with release of stored water after flood into Russell Creek, and is also diverted as required to replenish losses from seepage and evaporation from small recreation pool maintained in the reservoir. City of Walla Walla diverts water for municipal supply about 11 mi upstream. Other small diversions upstream from station for irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,190 ft³/s Feb. 9, 1996, gage height, 6.89 ft (inside high-water mark), from rating curve extended above 1,500 ft³/s; no flow many days.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 31 or Apr. 1, 1931, discharge not determined, was greatest since at least 1913. A discharge of about 11,000 ft³/s, based on a slope-area measurement, was determined for the 1931 peak at old City of Walla Walla diversion dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,570 ft³/s Jan. 31, gage height, 4.73 ft; no flow part or all of each day Oct. 1-24, Nov. 5, Jun. 10-12, 16-30, July 1.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	15	7.9	92	1,340	96	265	116	32	0.63	1.1	2.2
2	0.00	5.7	7.9	81	872	87	302	108	25	1.1	1.1	2.3
3	0.00	8.1	7.9	175	508	88	299	102	18	1.3	1.2	2.2
4	0.00	14	7.1	169	364	83	265	106	11	1.3	1.2	2.3
5	0.00	16	13	157	261	81	228	147	8.8	1.6	0.73	2.2
6	0.00	12	13	123	199	83	220	164	7.6	1.6	0.78	2.3
7	0.00	9.0	13	89	161	155	208	154	6.9	1.7	1.1	2.5
8	0.00	20	13	71	135	337	216	132	7.0	1.6	1.3	3.6
9	0.00	27	13	61	117	404	237	107	6.6	1.9	1.1	3.1
10	0.00	28	14	51	99	456	233	90	2.5	1.6	1.5	2.9
11	0.00	18	15	46	85	452	218	90	0.15	0.99	1.5	3.2
12	0.00	14	15	43	79	461	199	126	4.2	0.66	1.6	3.0
13	0.00	13	15	58	73	550	186	168	4.5	0.60	1.5	2.5
14	0.00	12	40	57	76	545	169	161	2.8	0.70	1.7	2.4
15	0.00	11	39	59	71	553	145	137	2.4	0.65	1.0	2.5
16	0.00	9.1	47	57	112	655	126	114	2.4	0.84	1.1	2.6
17	0.00	9.1	41	53	151	467	115	98	1.5	1.1	1.1	2.9
18	0.00	11	36	49	226	344	111	87	0.22	1.1	1.5	2.8
19	0.00	8.3	29	46	246	248	97	74	0.00	0.97	1.5	2.3
20	0.00	7.9	22	43	231	211	91	63	0.52	0.86	1.3	2.2
21	0.00	8.0	20	41	221	191	91	57	1.4	0.77	1.6	2.6
22	0.31	7.9	17	41	283	241	100	50	0.72	0.90	1.5	2.3
23	0.00	8.1	20	58	276	332	91	50	0.58	1.1	1.4	2.5
24	1.4	8.0	22	69	224	298	98	51	0.00	1.1	1.2	2.3
25	10	8.0	20	76	180	262	104	63	0.00	1.1	1.3	2.2
26	13	8.0	21	179	154	314	122	56	0.00	1.1	1.9	2.2
27	14	8.3	30	673	132	323	137	50	0.00	1.1	2.3	2.2
28	17	7.9	37	398	111	277	146	48	0.00	0.94	2.2	2.2
29	21	8.1	52	276	---	219	141	42	0.00	1.1	2.2	2.2
30	20	7.9	68	791	---	184	128	41	0.00	0.63	2.2	18
31	19	---	99	1,100	---	197	---	41	---	0.92	2.4	---
TOTAL	115.71	348.4	814.8	5,282	6,987	9,194	5,088	2,893	146.79	33.56	45.11	90.7
MEAN	3.73	11.6	26.3	170	250	297	170	93.3	4.89	1.08	1.46	3.02
MAX	21	28	99	1,100	1,340	655	302	168	32	1.9	2.4	18
MIN	0.00	5.7	7.1	41	71	81	91	41	0.00	0.60	0.73	2.2
AC-FT	230	691	1,620	10,480	13,860	18,240	10,090	5,740	291	67	89	180

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 2003, BY WATER YEAR (WY)

MEAN	6.10	45.0	110	149	177	173	163	98.6	35.3	3.41	1.96	2.32
MAX	96.0	233	433	372	627	393	381	344	179	18.4	7.64	11.5
(WY)	(1952)	(1996)	(1965)	(1974)	(1996)	(1997)	(1974)	(1948)	(1974)	(1981)	(1989)	(1971)
MIN	0.000	0.14	4.81	15.8	12.0	3.21	9.70	1.10	0.000	0.000	0.000	0.000
(WY)	(1989)	(1988)	(1953)	(1944)	(1977)	(1947)	(1947)	(1968)	(1973)	(1973)	(1985)	

SUMMARY STATISTICS			FOR 2002 CALENDAR YEAR			FOR 2003 WATER YEAR			WATER YEARS 1941 - 2003		
ANNUAL TOTAL			25,934.70			31,039.07			80.0		
ANNUAL MEAN			71.1			85.0			182		
HIGHEST ANNUAL MEAN									1974		
LOWEST ANNUAL MEAN									18.1		
HIGHEST DAILY MEAN			1,070			Feb 24			1,340		
LOWEST DAILY MEAN			0.00			Jul 13			0.00		
ANNUAL SEVEN-DAY MINIMUM			0.00			Aug 17			Oct 1		
ANNUAL RUNOFF (AC-FT)			51,440			61,570			3,070		
10 PERCENT EXCEEDS			166			239			219		
50 PERCENT EXCEEDS			27			15			29		
90 PERCENT EXCEEDS			0.00			0.62			0.06		

14018500 WALLA WALLA RIVER NEAR TOUCHET, WA

LOCATION.--Lat 46°01'40", long 118°43'43", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.6, T.6 N., R.33 E., Walla Walla County, Hydrologic Unit 17070102, on left bank 0.8 mi upstream from Gardena Creek, 2.8 mi southwest of Touchet, 3.4 mi downstream from Touchet River, and at mile 18.2.

DRAINAGE AREA.--1,657 mi².

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 1935: Drainage area. WDR WA-96-1: 1992(M), 1993(M), 1995 (M,P).

GAGE.--Water-stage recorder. Elevation of gage is 405 ft above NGVD of 1929, from topographic map. Prior to Nov. 27, 1951, nonrecording gage at same site and datum. U.S. Geological Survey satellite telemeter at station.

REMARKS.--Records fair. Many diversions upstream from station for irrigation.

AVERAGE DISCHARGE.--52 years (water years 1952-2003), 573 ft³/s, 415,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft³/s Dec. 22, 1964, gage height, 18.90 ft, from rating curve extended above 15,000 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 20.58 ft Feb. 10, 1996, from high-water mark; no flow July 30 to Aug. 8, Aug. 12, 13, 1968, Oct. 5-7, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

	Date	Time	Discharge (ft ³ /s)	Gage height (ft)		Date	Time	Discharge (ft ³ /s)	Gage height (ft)
	Jan 27	1830	3,030	9.00		Mar 16	1400	4,300	10.30
	Feb 1	1900	*11,100	*15.92					

Minimum daily discharge, 5.2 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	93	176	601	8,640	961	1,540	900	316	41	11	18
2	46	129	177	529	7,050	906	1,670	904	266	39	12	18
3	50	159	181	578	3,540	889	1,730	878	211	43	12	16
4	55	172	174	824	2,530	880	1,600	868	183	40	e16	17
5	63	182	175	774	1,970	855	1,470	905	158	37	e16	19
6	52	176	194	724	1,630	851	1,400	910	146	34	e30	20
7	44	168	185	618	1,390	871	1,390	866	128	30	e28	24
8	43	134	188	555	1,240	1,540	1,360	804	118	26	e26	31
9	37	172	194	492	1,140	1,960	1,380	751	102	22	25	198
10	38	212	208	448	1,050	2,540	1,410	679	88	21	21	195
11	34	209	195	417	970	2,860	1,350	622	91	16	15	138
12	30	162	176	399	914	2,760	1,320	693	86	14	12	106
13	34	155	168	420	875	3,190	1,300	905	66	14	17	93
14	42	158	203	458	908	3,430	1,230	871	57	18	13	66
15	41	165	318	476	909	3,210	1,130	847	69	21	14	54
16	46	158	308	475	973	4,000	1,000	801	69	17	11	45
17	34	321	457	1,250	3,300	938	701	59	13	7.3	47	
18	31	282	438	1,410	2,460	902	650	51	12	9.0	52	
19	27	155	261	422	1,610	1,950	827	592	46	11	8.2	52
20	28	158	251	408	1,560	1,670	760	499	66	13	9.2	42
21	31	150	240	397	1,500	1,490	731	459	77	9.7	8.7	39
22	29	150	239	407	1,570	1,570	760	411	82	10	e6.0	36
23	29	161	227	462	1,650	2,330	791	384	85	8.2	e5.2	38
24	30	170	219	538	1,500	2,190	751	388	74	6.3	10	39
25	38	173	217	551	1,330	1,880	869	476	62	6.4	17	42
26	36	160	214	641	1,210	1,880	930	492	49	7.8	12	40
27	42	163	249	2,090	1,110	1,880	1,020	448	44	14	16	38
28	57	167	280	2,150	1,020	1,700	991	395	41	14	10	39
29	62	169	382	1,470	---	1,500	980	381	43	15	16	41
30	86	172	407	2,240	---	1,330	951	372	45	13	21	47
31	94	---	506	4,720	---	1,270	---	367	---	15	20	---
TOTAL	1,354	4,843	7,515	26,179	52,449	60,103	34,481	20,219	2,978	601.4	454.6	1,650
MEAN	43.7	161	242	844	1,873	1,939	1,149	652	99.3	19.4	14.7	55.0
MAX	94	212	506	4,720	8,640	4,000	1,730	910	316	43	30	198
MIN	27	93	168	397	875	851	731	367	41	6.3	5.2	16
AC-FT	2,690	9,610	14,910	51,930	104,000	119,200	68,390	40,100	5,910	1,190	902	3,270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2003, BY WATER YEAR (WY)

MEAN	80.4	295	791	1,085	1,301	1,213	1,077	720	256	42.2	19.0	40.2
MAX	392	1,056	2,890	2,698	3,700	3,105	2,437	1,544	1,130	139	82.7	181
(WY)	(1952)	(1996)	(1965)	(1965)	(1996)	(1972)	(1974)	(1993)	(1974)	(1974)	(1976)	(1959)
MIN	9.20	55.3	190	306	286	339	242	60.6	21.2	5.85	3.07	3.07
(WY)	(1989)	(1988)	(1988)	(1979)	(1977)	(1977)	(1973)	(1968)	(1968)	(1968)	(1973)	(1994)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1952 - 2003

ANNUAL TOTAL	193,965.3		212,827.0									
ANNUAL MEAN	531		583									
HIGHEST ANNUAL MEAN												
LOWEST ANNUAL MEAN												
HIGHEST DAILY MEAN	4,250	Feb 24		8,640	Feb 1							
LOWEST DAILY MEAN	5.6	Aug 17		5.2	Aug 23							
ANNUAL SEVEN-DAY MINIMUM	7.0	Aug 15		7.7	Aug 17							
ANNUAL RUNOFF (AC-FT)	384,700		422,100									
10 PERCENT EXCEEDS	1,240		1,550									
50 PERCENT EXCEEDS	251		183									
90 PERCENT EXCEEDS	22		16									

e Estimated

WALLA WALLA RIVER BASIN

14018500 WALLA WALLA RIVER NEAR TOUCHET, WA—Continued
WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: August 2002 to current year.

INSTRUMENTATION.--Water-temperature sensor interfaced with a data-collection platform for satellite telemetry.

REMARKS.--Records good, except for Apr. 15 and Aug. 8, which are fair, and Apr. 16-May 19, which are poor.

EXTREMES FOR PERIOD OF RECORD.--

WATER TEMPERATURE: Maximum, 28.8°C Aug. 15, 2002; minimum, 0.3°C Nov. 4, 2002.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum 28.2°C Aug. 18, but may have been higher during periods of missing record; minimum, 0.3°C Nov. 4.

TEMPERATURE, WATER, DEGREES CELSIUS
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.1	11.0	12.5	2.6	0.9	1.7	3.5	2.9	3.2	6.0	5.0	5.4
2	14.1	10.7	12.4	2.0	0.4	1.3	3.9	3.1	3.3	7.6	5.4	6.5
3	13.2	11.8	12.7	1.9	0.4	1.1	3.7	3.0	3.2	8.4	7.2	7.7
4	14.6	12.9	13.7	2.0	0.3	1.2	3.7	3.0	3.4	8.3	7.2	7.7
5	15.8	13.3	14.4	2.2	0.7	1.5	4.2	3.3	3.7	7.4	6.4	6.8
6	17.1	13.7	15.3	2.3	0.9	1.7	4.6	3.7	4.2	6.4	5.0	5.7
7	17.3	14.1	15.7	3.6	1.7	2.5	4.9	3.9	4.5	5.4	4.5	5.0
8	16.8	13.7	15.2	5.5	3.4	4.7	5.0	4.4	4.7	5.1	4.1	4.6
9	16.1	13.1	14.6	7.1	5.0	6.0	5.3	4.5	4.9	4.7	3.8	4.2
10	14.2	12.4	13.3	8.3	6.7	7.5	5.2	4.4	4.9	4.3	3.6	4.0
11	13.4	10.8	12.1	8.9	7.7	8.2	5.2	4.3	4.7	4.7	3.6	4.1
12	12.4	9.8	11.1	9.1	8.2	8.6	7.1	5.1	5.9	5.1	4.1	4.6
13	11.5	8.8	10.2	9.6	8.3	8.9	8.2	7.0	7.6	5.8	4.5	5.2
14	10.7	7.9	9.4	9.9	8.7	9.2	9.5	8.1	8.9	6.5	5.5	5.9
15	10.4	7.7	9.2	9.0	7.4	8.1	9.9	9.0	9.5	6.7	6.0	6.3
16	10.7	7.9	9.3	7.6	6.6	7.1	9.6	7.9	8.7	6.6	5.6	6.0
17	10.9	7.9	9.4	8.1	6.6	7.2	8.0	6.0	6.8	6.1	5.4	5.7
18	11.1	8.0	9.6	8.0	7.0	7.4	6.2	4.4	5.5	5.6	5.0	5.3
19	11.8	8.9	10.3	9.1	7.6	8.4	5.3	3.4	4.3	5.4	4.6	5.1
20	12.4	10.2	11.2	9.9	8.4	9.1	4.2	3.2	3.8	5.3	4.6	5.0
21	12.9	10.3	11.6	9.4	8.7	9.0	4.5	3.4	4.0	5.2	4.3	4.7
22	12.2	10.0	11.2	9.4	8.7	9.1	4.9	3.6	4.3	4.8	4.0	4.4
23	11.2	9.3	10.2	9.8	8.9	9.3	5.2	4.1	4.8	5.5	3.9	4.6
24	9.6	7.5	8.6	9.0	6.6	7.8	4.9	4.0	4.5	6.6	4.9	5.6
25	8.1	6.1	7.2	6.6	4.4	5.3	4.4	3.2	3.8	7.8	6.3	6.9
26	7.2	5.0	6.2	4.5	3.3	3.8	5.0	3.4	4.2	10.3	7.5	8.7
27	6.0	4.2	5.2	3.7	3.0	3.4	6.2	4.5	5.4	10.3	7.8	8.9
28	7.6	5.3	6.5	3.4	2.7	3.1	6.8	5.8	6.4	7.9	6.9	7.4
29	7.1	5.7	6.6	3.3	2.8	3.0	6.6	4.9	5.7	7.4	5.7	6.3
30	5.9	3.7	5.0	3.3	2.8	3.1	5.9	4.6	5.1	8.1	6.1	7.2
31	3.7	1.9	3.1	---	---	---	6.3	5.2	5.8	8.6	7.8	8.3
MONTH	17.3	1.9	10.4	9.9	0.3	5.6	9.9	2.9	5.2	10.3	3.6	5.9
	FEBRUARY			MARCH			APRIL			MAY		
1	8.8	7.6	8.4	6.1	4.0	4.9	---	---	---	9.1	6.3	7.9
2	8.0	6.6	7.1	6.3	4.8	5.5	---	---	---	8.7	5.7	7.2
3	7.1	6.0	6.6	8.0	5.7	6.7	---	---	---	8.5	5.8	7.8
4	6.9	5.2	5.8	8.3	6.1	7.3	---	---	---	10.1	8.3	9.1
5	5.8	4.8	5.2	8.1	6.5	7.1	---	---	---	11.8	8.4	10.1
6	5.3	3.5	4.5	7.5	6.0	6.8	---	---	---	11.8	9.2	10.4
7	5.0	3.6	4.2	7.2	5.7	6.4	---	---	---	12.2	9.4	10.9
8	5.3	3.5	4.5	7.4	6.4	6.8	---	---	---	11.6	8.0	9.9
9	5.6	3.7	4.6	7.3	5.0	6.3	---	---	---	10.6	6.7	8.7
10	6.1	4.3	5.2	5.3	3.6	4.5	---	---	---	8.9	5.5	7.2
11	5.7	4.4	5.0	5.0	3.5	4.4	---	---	---	8.3	5.9	7.0
12	5.4	3.8	4.7	4.9	3.7	4.4	---	---	---	8.5	6.4	7.3
13	5.5	4.1	4.7	4.2	3.3	3.6	---	---	---	9.2	5.4	7.4
14	7.0	5.1	5.8	4.4	3.2	3.7	---	---	---	7.4	5.4	6.3
15	7.3	6.5	6.8	4.7	3.5	4.2	12.5	10.5	11.4	8.0	5.7	7.2
16	7.7	6.4	7.0	5.8	4.0	4.9	12.0	9.6	11.0	11.0	7.8	9.4
17	7.6	6.6	7.1	6.0	4.1	5.0	10.9	9.7	10.3	10.8	8.0	9.4
18	8.0	6.9	7.4	6.3	4.2	5.2	12.7	9.5	11.1	11.2	7.8	9.6
19	7.1	5.6	6.4	5.7	3.4	4.5	12.5	9.5	10.9	10.5	6.8	8.8
20	7.5	6.2	6.9	4.1	2.1	3.2	11.9	8.4	10.3	---	---	---
21	8.2	6.4	7.4	4.0	2.7	3.5	9.8	7.2	8.6	---	---	---
22	8.2	6.7	7.5	3.7	3.0	3.4	9.4	7.4	8.6	---	---	---
23	7.4	5.9	6.6	5.9	3.7	4.8	10.8	8.1	9.6	---	---	---
24	6.1	3.5	4.3	5.9	4.0	4.8	10.7	8.3	9.7	---	---	---
25	4.2	2.4	3.4	5.1	4.0	4.6	12.9	9.5	11.3	---	---	---
26	4.3	2.3	3.4	5.1	3.4	4.4	11.4	9.5	10.5	---	---	---
27	5.6	3.1	4.2	6.0	4.3	5.1	12.0	9.1	10.7	---	---	---
28	5.4	4.0	4.8	6.2	3.5	5.0	11.2	7.9	9.7	---	---	---
29	---	---	---	---	---	---	9.6	7.1	8.4	---	---	---
30	---	---	---	---	---	---	9.5	7.4	8.4	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	8.8	2.3	5.7	8.3	2.1	5.0	12.9	7.1	10.0	12.2	5.4	8.5

WALLA WALLA RIVER BASIN

515

14018500 WALLA WALLA RIVER NEAR TOUCHET, WA—Continued

TEMPERATURE, WATER, DEGREES CELSIUS—CONTINUED
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

14105700 COLUMBIA RIVER AT THE DALLES, OR

LOCATION.--Lat 45°36'27", long 121°10'20", in SW 1/4 SW 1/4 sec.34, T.2 N., R.13 E., Wasco County, Hydrologic Unit 17070105, Corps of Engineers land, on left bank 0.3 mi downstream from Mill Creek, 2.6 mi downstream from The Dalles Dam, and at mile 188.9.

DRAINAGE AREA.--237,000 mi², approximately.

PERIOD OF RECORD.--October 1857 to September 1877 (annual maximum only, at Lower Cascades Landing, published in WSP 1318), June 1878 to current year. Published as "near The Dalles" 1936-56.

REVISED RECORDS.--WSP 534: 1920(m). SP 1094: 1894. WSP 1248: 1866, 1888, 1899, 1909. WSP 1518: 1876(M).

GAGE.--Ultrasonic velocity meter (UVM) with water-stage and velocity-index recorder. Datum of gage is NGVD of 1929. See WSP 1738 for history of changes prior to Mar. 16, 1957. Mar. 16, 1957, to Sept 30, 1968, water-stage recorder at site 0.4 mi upstream at same datum.

REMARKS.--Records good. Considerable regulation by many large reservoirs. Diurnal fluctuations caused by powerplant and gates at The Dalles Dam. Many diversions for irrigation upstream from station. Continuous water-quality records for the period October 1957 to February 1985 have been collected at this location.

AVERAGE DISCHARGE.--125 years (water years 1879-2003), 190,900 ft³/s, 138,300,000 acre-ft/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (since 1858), 1,240,000 ft³/s June 6, 1894, elevation, 106.5 ft; minimum discharge (since 1878), 12,100 ft³/s Apr. 16, 1968 (due to closure of John Day dam, recorded by UVM).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 355,000 ft³/s May 31; maximum elevation, 82.52 ft May 31; minimum daily discharge, 68,300 ft³/s Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91400	143000	133000	119000	182000	132000	179000	239000	328000	174000	151000	115000
2	95400	146000	128000	108000	208000	117000	195000	199000	299000	170000	145000	97000
3	103000	113000	146000	107000	170000	139000	178000	201000	295000	115000	102000	98100
4	127000	129000	114000	104000	171000	137000	173000	194000	305000	136000	137000	102000
5	78300	112000	139000	100000	141000	156000	190000	222000	286000	157000	121000	93300
6	87100	120000	139000	114000	141000	137000	191000	226000	276000	114000	122000	94100
7	109000	123000	127000	116000	155000	149000	187000	249000	268000	133000	125000	78700
8	87500	127000	124000	136000	144000	150000	182000	201000	281000	116000	115000	81200
9	136000	115000	128000	141000	122000	130000	200000	239000	260000	187000	133000	98600
10	131000	119000	139000	125000	122000	137000	191000	222000	268000	175000	117000	90400
11	125000	130000	127000	129000	132000	126000	186000	174000	298000	160000	129000	68300
12	103000	133000	123000	103000	124000	125000	183000	202000	303000	164000	151000	81100
13	85900	130000	118000	106000	132000	134000	183000	200000	263000	140000	137000	84200
14	106000	106000	116000	122000	127000	143000	184000	262000	282000	174000	131000	82800
15	118000	138000	105000	120000	110000	144000	200000	222000	225000	152000	132000	81200
16	95700	111000	118000	121000	110000	151000	196000	244000	248000	146000	110000	100000
17	105000	119000	111000	132000	116000	175000	220000	238000	264000	172000	123000	99400
18	102000	148000	134000	142000	117000	186000	239000	244000	257000	142000	130000	92800
19	76600	118000	149000	117000	127000	192000	217000	229000	240000	102000	145000	86100
20	75300	126000	117000	130000	113000	172000	189000	219000	181000	143000	142000	80600
21	108000	121000	116000	108000	123000	153000	184000	221000	191000	152000	148000	83200
22	96700	134000	105000	124000	101000	133000	219000	251000	176000	146000	147000	112000
23	117000	128000	127000	116000	120000	115000	246000	250000	179000	159000	123000	120000
24	104000	122000	125000	123000	121000	130000	214000	253000	190000	162000	124000	104000
25	126000	130000	109000	110000	132000	160000	198000	232000	209000	152000	142000	104000
26	122000	145000	121000	86900	131000	175000	258000	248000	228000	126000	147000	113000
27	106000	145000	119000	109000	105000	221000	201000	315000	220000	116000	173000	127000
28	117000	130000	112000	148000	134000	231000	239000	328000	169000	146000	123000	75500
29	121000	123000	117000	155000	--	199000	220000	272000	191000	162000	107000	86600
30	132000	135000	110000	134000	--	192000	228000	347000	171000	135000	117000	107000
31	141000	--	106000	146000	--	183000	--	355000	--	125000	122000	--
TOTAL	3328900	3819000	3802000	3751900	3731000	4824000	6070000	7499000	7351000	4553000	4071000	2837200
MEAN	107400	127300	122600	121000	133200	155600	202300	241900	245000	146900	131300	94570
MAX	141000	148000	149000	155000	208000	231000	258000	355000	328000	187000	173000	127000
MIN	75300	106000	105000	86900	101000	115000	173000	174000	169000	102000	102000	68300
AC-FT	6603000	7575000	7541000	7442000	7400000	9568000	12040000	14870000	14580000	9031000	8075000	5628000

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1879 - 2003, BY WATER YEAR (WY)

(WY)	MEAN	104500	108400	116100	119200	129100	147100	204300	337500	434400	296600	171800	119700
1960	174800	200800	258300	275000	340400	345000	386400	624400	1002000	793300	385700	198200	
1996	1928	1996	1997	1996	1983	1881	1897	1894	1880	1880	1880	1880	
1998	141000	148000	149000	155000	208000	231000	258000	355000	328000	187000	173000	127000	
1999	69430	57830	52380	42430	51420	69820	98350	136100	123700	86780	91970	75760	
2000	1930	1937	1937	1937	1937	1937	1944	1977	1977	2001	1994	1994	

SUMMARY STATISTICS		FOR 2002 CALENDAR YEAR				FOR 2003 WATER YEAR				WATER YEARS 1879 - 2003			
ANNUAL TOTAL		61883600				55638000							
ANNUAL MEAN		169500				152400							
HIGHEST ANNUAL MEAN													
LOWEST ANNUAL MEAN													
HIGHEST DAILY MEAN		377000				Jun 6				May 31			
LOWEST DAILY MEAN		74300				Sep 16				Sep 11			
ANNUAL SEVEN-DAY MINIMUM		94200				Oct 16				Sep 7			
ANNUAL RUNOFF (AC-FT)		122700000				110400000				138300000			
10 PERCENT EXCEEDS		291000				239000				379000			
50 PERCENT EXCEEDS		143000				133000				142000			
90 PERCENT EXCEEDS		106000				102000				80900			

KLICKITAT RIVER BASIN

517

14107000 KLICKITAT RIVER ABOVE WEST FORK NEAR GLENWOOD, WA

LOCATION.--Lat 46°15'54", long 121°14'38", in NW 1/4 SW 1/4 sec.18, T.9 N., R.13 E., Yakima County, Hydrologic Unit 17070106, Yakama Nation Reservation, on right bank 0.8 mi upstream from Swamp Creek, 1.9 mi upstream from West Fork, 17.0 mi north of Glenwood, and at mile 64.7.

DRAINAGE AREA.--151 mi².

PERIOD OF RECORD.--October 1944 to September 1977, July 1991 to current year. Monthly discharge only for October 1944, published in WSP 1318.

GAGE.--Water-stage recorder. Elevation of gage is 2,720 ft above NGVD of 1929, from river-profile map.

REMARKS.--Records fair. No regulation or diversion upstream from station.

AVERAGE DISCHARGE.--45 years (water years 1945-77, 1992-2003), 326 ft³/s, 29.32 in/yr, 236,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,500 ft³/s Feb. 8, 1996, gage height, 5.70 ft, from high-water mark, from rating curve extended above 2,600 ft³/s; minimum discharge, 4.4 ft³/s Feb. 1, 1957 (result of freezeup, discharge measurement).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 4,850 ft³/s Dec. 2, 1977, from high-water mark.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

	Date	Time	Discharge (ft ³ /s)	Gage height (ft)		Date	Time	Discharge (ft ³ /s)	Gage height (ft)
	Jan 31	2045	*3,660	*4.59		May 30	2145	1,140	2.51

Minimum discharge, 52 ft³/s, Oct. 25, but may have been less during ice effect Oct. 31.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	78	e60	78	95	2,160	196	621	594	960	270	123	90
2	78	e65	77	105	1,150	192	569	613	876	251	122	89
3	78	e70	75	175	815	189	518	649	804	240	123	88
4	81	e75	76	186	640	187	472	632	757	234	122	88
5	78	e80	77	214	531	189	433	605	753	232	118	88
6	78	e81	75	181	457	187	409	552	781	232	121	86
7	78	84	72	168	403	185	380	522	813	220	124	86
8	75	113	70	156	373	181	375	495	819	213	119	88
9	74	89	72	176	347	190	393	476	766	207	118	91
10	74	83	77	167	319	209	405	473	707	200	112	92
11	74	80	76	169	297	226	435	473	620	197	110	99
12	74	93	88	154	282	307	495	499	571	195	107	101
13	74	126	109	126	274	604	572	544	543	189	107	93
14	74	99	192	129	263	683	577	606	492	186	106	92
15	73	89	230	123	256	783	545	647	448	182	103	91
16	72	87	209	119	255	720	526	605	418	178	103	91
17	71	96	157	116	250	618	501	544	415	173	103	92
18	71	91	133	112	235	535	476	501	452	166	103	92
19	71	102	123	111	226	487	460	481	451	160	99	91
20	71	102	117	112	223	464	464	475	384	157	99	88
21	71	95	112	110	247	441	498	488	352	155	98	88
22	71	95	103	123	259	565	545	545	321	151	94	88
23	71	92	e95	165	234	552	598	671	301	147	94	86
24	69	89	89	162	218	503	637	895	289	145	92	86
25	65	82	98	170	239	472	585	1,040	287	143	92	85
26	69	84	104	445	230	450	583	933	291	142	92	85
27	70	83	113	744	209	404	532	867	307	138	93	85
28	70	82	99	520	203	377	508	949	309	136	93	85
29	68	81	94	405	---	367	549	1,000	296	133	92	85
30	e62	79	100	447	---	408	581	1,070	291	126	92	84
31	e55	---	98	2,330	---	577	---	1,080	---	126	91	---
TOTAL	2,238	2,627	3,288	8,515	11,595	12,448	15,242	20,524	15,874	5,624	3,265	2,673
MEAN	72.2	87.6	106	275	414	402	508	662	529	181	105	89.1
MAX	81	126	230	2,330	2,160	783	637	1,080	960	270	124	101
MIN	55	60	70	95	203	181	375	473	287	126	91	84
AC-FT	4,440	5,210	6,520	16,890	23,000	24,690	30,230	40,710	31,490	11,160	6,480	5,300
CFSM	0.48	0.58	0.70	1.82	2.74	2.66	3.36	4.38	3.50	1.20	0.70	0.59
IN.	0.55	0.65	0.81	2.10	2.86	3.07	3.75	5.06	3.91	1.39	0.80	0.66

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 2003, BY WATER YEAR (WY)

MEAN	126	189	236	220	263	240	461	915	726	291	138	104
MAX	291	464	983	615	1,470	713	990	1,714	1,730	637	257	174
(WY)	(1998)	(1996)	(1996)	(1974)	(1996)	(1972)	(1997)	(1956)	(1974)	(1974)	(1974)	(1997)
MIN	58.1	61.3	71.1	69.3	78.3	98.1	170	224	170	89.8	61.7	56.8
(WY)	(1994)	(1994)	(1993)	(1993)	(1994)	(1977)	(1955)	(1977)	(1992)	(1977)	(1994)	(2001)

SUMMARY STATISTICS			FOR 2002 CALENDAR YEAR			FOR 2003 WATER YEAR			WATER YEARS 1945 - 2003		
ANNUAL TOTAL			107,466			103,913			326		
ANNUAL MEAN			294			285			539		1996
HIGHEST ANNUAL MEAN									126		1977
LOWEST ANNUAL MEAN									5,000		Feb 8, 1996
HIGHEST DAILY MEAN			1,940	Apr 14		2,330	Jan 31		4.5		Feb 1, 1957
LOWEST DAILY MEAN			55	Oct 31		55	Oct 31		5.6		Jan 30, 1957
ANNUAL SEVEN-DAY MINIMUM			64	Oct 27		64	Oct 27		236,100		
ANNUAL RUNOFF (AC-FT)			213,200			206,100			2.16		
ANNUAL RUNOFF (CFSM)			1.95			1.89			29.32		
ANNUAL RUNOFF (INCHES)			26.48			25.60			768		
10 PERCENT EXCEEDS			804			609			188		
50 PERCENT EXCEEDS			136			169			90		
90 PERCENT EXCEEDS			77			77					

e Estimated

KLICKITAT RIVER BASIN

14111400 KLICKITAT RIVER BELOW SUMMIT CREEK, NEAR GLENWOOD, WA

LOCATION.--Lat 45°57'45", long 121°06'04", in NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.31, T.6 N., R.14 E., Klickitat County, Bureau of Land Management lands, Hydrologic Unit 17070106, on right bank, 3 mi downstream from Summit Creek, 10 miles southeast of Glenwood, and at mile 34.3.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--October 1996 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above NGVD of 1929, from topographic map.

REMARKS.--Records fair. No regulation. Some upstream diversions for irrigation.

AVERAGE DISCHARGE.--7 years (water years 1997-2003), 1,486 ft³/s, 1,076,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,200 ft³/s Jan. 31, 2003, gage height, 10.09 ft; minimum discharge, 502 ft³/s Oct. 2, 5-10, 2001.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, about 21,000 ft³/s Feb. 8, 1996, gage height, 14.4 ft, from high-water mark, from rating extended above 4,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

	Date	Time	Discharge (ft ³ /s)	Gage height (ft)		Date	Time	Discharge (ft ³ /s)	Gage height (ft)
	Jan 27	0445	3,250	6.18		Mar 15	1100	3,270	6.09
	Jan 31	2030	*10,200	*10.09					

Minimum discharge, 516 ft³/s, Oct. 31.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	610	579	e600	775	7,310	1,280	e2,650	2,020	2,420	1,110	759	662
2	602	590	e600	867	4,680	1,230	e2,500	2,030	2,290	1,070	760	665
3	604	598	e600	1,340	3,760	1,210	e2,380	2,090	2,180	1,040	728	677
4	610	611	e600	1,440	3,210	1,180	e2,250	2,060	2,100	1,030	712	694
5	604	625	e595	1,590	2,860	1,180	e2,150	2,010	2,080	1,030	722	692
6	606	624	e595	1,370	2,590	1,250	e2,080	1,900	2,110	1,030	722	686
7	602	e620	591	1,230	2,390	1,330	e2,000	1,820	2,160	1,020	738	681
8	596	e730	585	1,140	2,250	1,390	e1,930	1,750	2,200	1,000	728	661
9	593	e690	584	1,070	2,140	1,540	e1,900	1,690	2,150	972	713	656
10	588	e650	603	1,010	2,030	1,700	e1,900	1,680	2,060	972	732	656
11	582	e630	618	983	1,910	1,770	e1,950	1,680	1,900	992	713	669
12	585	e640	650	997	1,800	2,010	e2,000	1,720	1,780	1,020	691	686
13	588	e750	703	1,020	1,730	2,610	e2,150	1,750	1,720	1,010	687	660
14	587	e710	989	1,050	1,640	2,790	e2,170	1,840	1,640	949	694	654
15	585	e660	1,120	1,010	1,590	3,130	e2,120	1,930	1,540	953	700	652
16	584	e640	1,170	975	1,630	3,030	e2,050	1,880	1,480	914	689	647
17	583	e650	946	936	1,630	2,820	e2,000	1,780	1,460	874	692	646
18	580	e690	826	901	1,600	2,610	e1,930	1,680	1,480	865	703	640
19	581	e700	774	875	1,550	2,480	e1,870	1,620	1,490	869	714	641
20	578	e670	746	864	1,510	2,440	e1,850	1,590	1,370	880	693	638
21	576	e660	740	844	1,560	2,370	e1,870	1,610	1,290	892	686	639
22	575	e650	708	896	1,660	e2,900	e1,900	1,700	1,230	862	693	697
23	572	e640	684	1,150	1,550	e3,050	1,980	1,880	1,170	874	678	684
24	578	e630	677	1,190	1,360	e2,920	2,070	2,200	1,120	867	669	690
25	598	e620	679	1,250	1,310	e2,800	1,970	2,450	1,100	853	676	693
26	601	e610	683	2,250	1,360	e2,920	2,030	2,380	1,110	832	685	709
27	601	e610	719	3,100	e1,370	e2,750	1,940	2,280	1,160	818	675	691
28	600	e600	730	2,710	1,320	e2,570	1,840	2,380	1,220	790	666	684
29	595	e600	726	2,480	---	e2,420	1,940	2,460	1,130	784	661	679
30	570	e600	739	2,710	---	e2,350	2,040	2,510	1,130	770	663	668
31	554	---	785	6,990	---	e2,500	---	2,570	---	764	663	---
TOTAL	18,268	19,277	22,365	47,013	61,300	68,530	61,410	60,940	49,270	28,706	21,705	20,097
MEAN	589	643	721	1,517	2,189	2,211	2,047	1,966	1,642	926	700	670
MAX	610	750	1,170	6,990	7,310	3,130	2,650	2,570	2,420	1,110	760	709
MIN	554	579	584	775	1,310	1,180	1,840	1,590	1,100	764	661	638
AC-FT	36,230	38,240	44,360	93,250	121,600	135,900	121,800	120,900	97,730	56,940	43,050	39,860

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 2003, BY WATER YEAR (WY)

(WY)	MEAN	820	994	1,131	1,554	1,678	1,965	2,225	2,493	2,049	1,254	902	784
(1998)	MAX	1,274	1,521	1,711	2,343	2,189	2,800	3,374	3,843	3,177	1,952	1,274	1,043
(2000)	MIN	539	643	642	619	615	701	840	1,279	790	618	601	553
(2001)	AC-FT	36,230	38,240	44,360	93,250	121,600	135,900	121,800	120,900	97,730	56,940	43,050	39,860

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1997 - 2003

ANNUAL TOTAL	464,783	478,881	1,486
ANNUAL MEAN	1,273	1,312	1,988
HIGHEST ANNUAL MEAN			1997
LOWEST ANNUAL MEAN			2001
HIGHEST DAILY MEAN	5,060	Apr 14	7,310
LOWEST DAILY MEAN	554	Oct 31	554
ANNUAL SEVEN-DAY MINIMUM	577	Oct 18	Oct 18
ANNUAL RUNOFF (AC-FT)	921,900		1,076,000
10 PERCENT EXCEEDS	2,280		2,620
50 PERCENT EXCEEDS	1,030		1,210
90 PERCENT EXCEEDS	600		628

e Estimated

14113000 KLICKITAT RIVER NEAR PITTS, WA

LOCATION.--Lat 45°45'24", long 121°12'32", in SW $\frac{1}{4}$ sec.8, T.3 N., R.13 E., Klickitat County, Hydrologic Unit 17070106, on left bank 2.8 mi south of Pitt, 4.8 mi southwest of Klickitat, 5.3 mi upstream from Silvias Creek, and at mile 7.0.

DRAINAGE AREA.--1,297 mi².

PERIOD OF RECORD.--July 1909 to January 1912, October 1928 to current year. Published as "at Klickitat" 1909-12 and as "at Pitt" 1928-35.

REVISED RECORDS.--WSP 1348: 1910(M), 1929-33(M), 1934, 1935-38(M), 1940(M), 1942-43(M), 1946(M), 1948(M). WSP 1935: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 288.9 ft above NGVD of 1929 (river-profile survey). July 3, 1909, to Jan. 31, 1912, nonrecording gage at site 7 mi upstream at different datum; Oct. 1, 1928, to Sept. 30, 1935, nonrecording gage at site 3.5 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Several small diversions upstream from station for irrigation of about 7,500 acres, mostly in vicinity of Glenwood. The largest of these is Hellroaring Irrigation Canal, which at times diverts the entire flow of Hellroaring Creek (tributary to Big Muddy Creek). No regulation. Water temperatures October 1950 to September 1970. Chemical analyses October 1950 to September 1970, October 1975 to September 1986. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--77 years (water years 1909-11, 1929-2003), 1,588 ft³/s, 1,150,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,000 ft³/s Feb. 8, 1996, gage height, 17.90 ft from high-water mark in well, from rating curve extended above 16,000 ft³/s on basis of slope-area measurement at gage height 14.34 ft; minimum discharge, 412 ft³/s Jan. 16, 1979, gage height, 3.81 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

	Date	Time	Discharge (ft ³ /s)	Gage height (ft)		Date	Time	Discharge (ft ³ /s)	Gage height (ft)
	Jan 27	0500	4,410	7.00		Mar 15	1400	4,180	6.86
	Feb 1	0000	*13,800	*10.83					

Minimum discharge, 585 ft³/s, Nov. 1.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	703	619	655	1,060	11,000	1,590	2,970	2,090	2,480	1,190	823	685
2	697	635	656	1,160	7,130	1,530	2,840	2,090	2,310	1,150	824	684
3	698	648	653	1,910	5,480	1,500	2,670	2,130	2,170	1,120	794	693
4	712	666	651	2,280	4,450	1,460	2,480	2,120	2,060	1,110	767	717
5	705	681	652	2,650	3,800	1,440	2,350	2,090	2,020	1,110	776	725
6	706	687	651	2,070	3,360	1,600	2,290	1,990	2,040	1,110	784	721
7	704	686	646	1,770	3,010	2,530	2,180	1,900	2,100	1,100	807	712
8	696	791	640	1,590	2,780	2,470	2,090	1,840	2,150	1,090	807	693
9	692	755	638	1,450	2,560	2,940	2,060	1,790	2,110	1,060	765	684
10	685	712	653	1,350	2,390	3,130	2,050	1,750	2,020	1,050	783	686
11	678	692	698	1,290	2,240	3,010	2,080	1,730	1,880	1,060	778	694
12	676	705	713	1,490	2,120	2,980	2,120	1,770	1,770	1,080	738	726
13	674	819	787	1,650	2,030	3,480	2,270	1,790	1,700	1,090	727	695
14	675	773	993	1,650	1,950	3,620	2,290	1,830	1,650	1,030	732	684
15	670	725	1,310	1,560	1,890	3,960	2,200	1,910	1,560	1,020	745	682
16	669	703	1,320	1,460	2,190	3,850	2,120	1,890	1,500	1,020	727	677
17	669	712	1,150	1,380	2,130	3,520	2,070	1,820	1,470	971	728	676
18	669	753	976	1,310	2,290	3,230	1,990	1,730	1,470	950	737	669
19	668	766	892	1,250	2,110	3,020	1,920	1,660	1,500	953	754	670
20	664	739	848	1,210	2,040	2,960	1,880	1,620	1,410	953	742	666
21	662	722	854	1,170	2,030	2,860	1,900	1,620	1,340	981	721	665
22	661	717	813	1,360	2,140	3,400	1,950	1,670	1,300	945	729	713
23	656	710	769	1,920	2,010	3,670	2,030	1,800	1,250	952	719	732
24	654	696	753	1,930	1,810	3,430	2,130	2,080	1,200	956	702	728
25	676	681	757	2,170	1,710	3,280	2,060	2,420	1,180	938	701	735
26	677	668	776	3,120	1,740	3,410	2,140	2,410	1,180	918	713	753
27	680	669	858	4,210	1,710	3,160	2,070	2,280	1,200	899	710	741
28	678	666	888	3,580	1,650	2,930	1,940	2,350	1,260	866	695	727
29	674	664	898	3,150	---	2,760	2,000	2,480	1,200	854	687	725
30	657	659	931	3,880	---	2,690	2,110	2,510	1,190	836	686	713
31	616	---	1,190	8,640	---	2,840	---	2,640	---	824	686	---
TOTAL	21,001	21,119	25,669	66,670	81,750	88,250	65,250	61,800	49,670	31,186	23,087	21,071
MEAN	677	704	828	2,151	2,920	2,847	2,175	1,994	1,656	1,006	745	702
MAX	712	819	1,320	8,640	11,000	3,960	2,970	2,640	2,480	1,190	824	753
MIN	616	619	638	1,060	1,650	1,440	1,880	1,620	1,180	824	686	665
AC-FT	41,660	41,890	50,910	132,200	162,200	175,000	129,400	122,600	98,520	61,860	45,790	41,790

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 2003, BY WATER YEAR (WY)

MEAN	762	979	1,468	1,855	2,253	2,285	2,338	2,476	1,943	1,161	832	744
MAX	1,299	2,763	6,160	7,325	8,225	6,111	4,942	5,235	4,161	2,250	1,387	1,082
(WY)	(1998)	(1910)	(1934)	(1974)	(1996)	(1910)	(1943)	(1956)	(1974)	(1974)	(1997)	(1997)
MIN	501	501	521	524	610	742	866	900	784	603	473	448
(WY)	(1945)	(1994)	(1931)	(1979)	(1994)	(1977)	(1977)	(1977)	(1992)	(1994)	(1994)	(1994)

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR FOR 2003 WATER YEAR

ANNUAL TOTAL	556,309		556,523		1,588	
ANNUAL MEAN	1,524		1,525		2,876	
HIGHEST ANNUAL MEAN					751	
LOWEST ANNUAL MEAN					751	
HIGHEST DAILY MEAN	6,260	Jan 8	11,000	Feb 1	40,000	Feb 8, 1996
LOWEST DAILY MEAN	616	Oct 31	616	Oct 31	360	Dec 29, 1993
ANNUAL SEVEN-DAY MINIMUM	645	Oct 29	645	Oct 29	395	Dec 24, 1993
ANNUAL RUNOFF (AC-FT)	1,103,000		1,104,000		1,150,000	
10 PERCENT EXCEEDS	2,650		2,800		3,020	
50 PERCENT EXCEEDS	1,300		1,170		1,150	
90 PERCENT EXCEEDS	676		674		640	

WHITE SALMON RIVER BASIN

14123500 WHITE SALMON RIVER NEAR UNDERWOOD, WA

LOCATION.--Lat 45°45'08", long 121°31'33", in NW 1/4 NW 1/4 sec.14, T.3 N., R.10 E., Skamania County, Hydrologic Unit 17070105, on right bank 300 ft downstream from bridge, 1,000 ft downstream from Pacific Power & Light Co.'s Condit powerplant, 1.7 mi north of Underwood, and at mile 1.9.

DRAINAGE AREA.--386 mi².

PERIOD OF RECORD.--October 1912 to February 1913 (published as "at Condit Dam, near Underwood"), March 1915 to September 1930, September 1935 to current year.

REVISED RECORDS.--WSP 484: 1915-17. WSP: 1348 1936-41(M). WSP 1638: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 112.96 ft above NGVD of 1929. Prior to March 1913, reference point at dam 1 mi upstream at different datum. March 1915, to July 16, 1918, water-stage recorder at site 200 ft upstream at datum 3.24 ft higher, and July 17, 1918, to Sept. 30, 1930, at datum 2.24 ft higher than present datum.

REMARKS.--No estimated daily discharges. Records good. Diversions for irrigation of about 4,000 acres in Trout Lake area. Low and medium flows regulated by powerplant of Pacific Power & Light Co. Chemical analyses August 1960 to August 1961, water years 1964-1968 (miscellaneous), October 1967 to September 1970 (monthly), November 1975 to June 1980. Water temperatures July 1968 to August 1970. U.S. Geological Survey satellite telemeter at station.

AVERAGE DISCHARGE.--83 years (water years 1916-30, 1936-2003), 1,122 ft³/s, 813,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,200 ft³/s Feb. 8, 1996, result of flashboard failure on Condit Dam, gage height, 19.16 ft, from rating curve extended above 8,030 ft³/s, on basis of theoretical weir computation of peak flow; minimum discharge, practically no flow at times when powerplant is shut down; minimum daily discharge, 158 ft³/s Jan. 17, 1950.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,900 ft³/s Jan. 31, gage height, 10.72 ft; minimum discharge, 239 ft³/s Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	589	536	513	781	6,430	1,260	1,980	1,460	1,290	815	632	558
2	589	546	514	946	3,870	1,250	1,880	1,450	1,190	779	639	561
3	598	565	513	1,480	2,990	1,210	1,800	1,460	1,110	784	630	544
4	612	538	509	1,830	2,440	1,210	1,710	1,450	1,100	769	627	556
5	601	534	509	2,100	2,130	1,230	1,660	1,450	1,100	778	637	542
6	600	537	509	1,690	1,880	1,440	1,640	1,360	1,080	780	628	535
7	600	542	509	1,420	1,690	1,880	1,580	1,320	1,090	760	627	543
8	600	594	507	1,220	1,570	1,860	1,550	1,330	1,090	747	621	543
9	581	604	486	1,070	1,480	2,020	1,550	1,280	1,070	759	621	542
10	569	605	525	1,020	1,430	2,180	1,550	1,250	1,050	747	610	553
11	584	590	579	936	1,350	2,100	1,570	1,280	1,030	745	618	543
12	581	628	597	1,010	1,320	2,280	1,570	1,290	992	738	596	563
13	583	707	683	1,070	1,260	2,820	1,630	1,290	997	708	616	550
14	590	662	955	1,150	1,250	2,840	1,640	1,240	976	711	587	568
15	584	612	1,380	1,070	1,210	2,950	1,580	1,260	939	710	603	529
16	579	572	1,440	968	1,240	2,770	1,540	1,320	930	699	610	556
17	578	593	1,210	944	1,320	2,430	1,530	1,240	895	692	587	573
18	578	597	925	925	1,350	2,170	1,490	1,220	921	682	586	542
19	576	626	805	906	1,260	2,010	1,450	1,170	921	678	595	596
20	568	585	778	851	1,300	2,000	1,430	1,150	885	677	594	546
21	552	583	760	833	1,440	2,050	1,420	1,150	903	693	582	562
22	538	571	651	978	1,730	2,950	1,460	1,140	904	681	589	563
23	553	554	641	1,270	1,590	3,250	1,460	1,190	874	689	590	551
24	549	548	662	1,320	1,470	2,790	1,510	1,290	835	678	585	537
25	552	547	636	1,460	1,440	2,490	1,460	1,300	834	681	591	561
26	556	517	611	2,660	1,360	2,470	1,470	1,310	838	664	600	553
27	548	523	766	3,220	1,370	2,250	1,440	1,230	826	672	569	532
28	568	524	775	2,590	1,320	2,090	1,400	1,270	861	667	565	538
29	547	522	753	2,210	---	1,980	1,440	1,280	813	675	568	529
30	550	517	735	2,620	---	1,920	1,490	1,280	827	655	560	518
31	535	---	863	6,160	---	1,950	---	1,290	---	665	560	---
TOTAL	17,788	17,179	22,299	48,708	50,490	66,100	46,880	40,000	29,171	22,178	18,623	16,487
MEAN	574	573	719	1,571	1,803	2,132	1,563	1,290	972	715	601	550
MAX	612	707	1,440	6,160	6,430	3,250	1,980	1,460	1,290	815	639	596
MIN	535	517	486	781	1,210	1,210	1,400	1,140	813	655	560	518
AC-FT	35,280	34,070	44,230	96,610	100,100	131,100	92,990	79,340	57,860	43,990	36,940	32,700

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 2003, BY WATER YEAR (WY)

(WY)	MEAN	574	808	1,149	1,336	1,536	1,518	1,515	1,517	1,265	890	700	631
(1998)	MAX	1,210	1,607	2,984	3,362	4,110	3,417	2,518	2,631	2,506	1,911	1,225	1,026
(1956)	MIN	429	396	452	430	508	558	651	659	587	456	424	391
(1993)	AC-FT	35,280	34,070	44,230	96,610	100,100	131,100	92,990	79,340	57,860	43,990	36,940	32,700

SUMMARY STATISTICS

FOR 2002 CALENDAR YEAR

FOR 2003 WATER YEAR

WATER YEARS 1916 - 2003

ANNUAL TOTAL	411,868	395,903	
ANNUAL MEAN	1,128	1,085	1,122
HIGHEST ANNUAL MEAN			1,765
LOWEST ANNUAL MEAN			554
HIGHEST DAILY MEAN	3,620	Jan 8	15,400
LOWEST DAILY MEAN	486	Dec 9	158
ANNUAL SEVEN-DAY MINIMUM	506	Dec 3	372
ANNUAL RUNOFF (AC-FT)	816,900	785,300	813,000
10 PERCENT EXCEEDS	1,770	1,900	1,910
50 PERCENT EXCEEDS	1,070	833	936
90 PERCENT EXCEEDS	568	545	526

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